INTERIM MEASURES WORK PLAN
Grenada Manufacturing Site
Grenada, Mississippi

prepared for

Meritor Automotive, Inc.
Troy, Michigan

June 2000

27-19071.001

INTERIM MEASURES WORK PLAN
GRENADA MANUFACTURING SITE
GRENADA, MISSISSIPPI

Prepared for:

Meritor Automotive, Inc.
Troy, Michigan

Prepared by:

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June 2000

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June 13, 2000

27-19071.001

BROWN AND CALDWELL
Environmental Engineering & Consulting

Mr. Don Webster
USEPA Region 4
Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, GA 30303-8960

RE: Interim Measures Work Plan
Grenada Manufacturing, LLC
Grenada, Mississippi

Dear Mr. Webster:

On behalf of Meritor Automotive, Inc., Brown and Caldwell is submitting three copies of the draft Interim Measures Work Plan for the referenced site. Two copies have also been sent to Mr. Louis Crawford at the Mississippi Department of Environmental Quality.

As discussed during our April meeting, the Work Plan addresses additional data collection and the evaluation of interim measures for both source control and site-wide groundwater. This additional data will be used in the evaluation of interim measures, as well as to revise the Summary of Investigative Work. As stated in your letter dated May 24, 2000, the sampling described in this Work Plan will be initiated after receiving approval of the Interim Measures Work Plan.

Please provide your comments regarding this Work Plan to Mr. Don Williams at Grenada Manufacturing. If you should have any questions, please feel free to call me at (615) 255-2288 or contact me by e-mail at dshowers@brwncald.com.

Sincerely,

BROWN AND CALDWELL

Dale R. Showers, P.E.
Project Manager
Design & Solid Waste

cc: Louis Crawford, P.E., MDEQ
John Bozick, Meritor Automotive
Don Williams, Grenada Manufacturing
John Kandler, Textron

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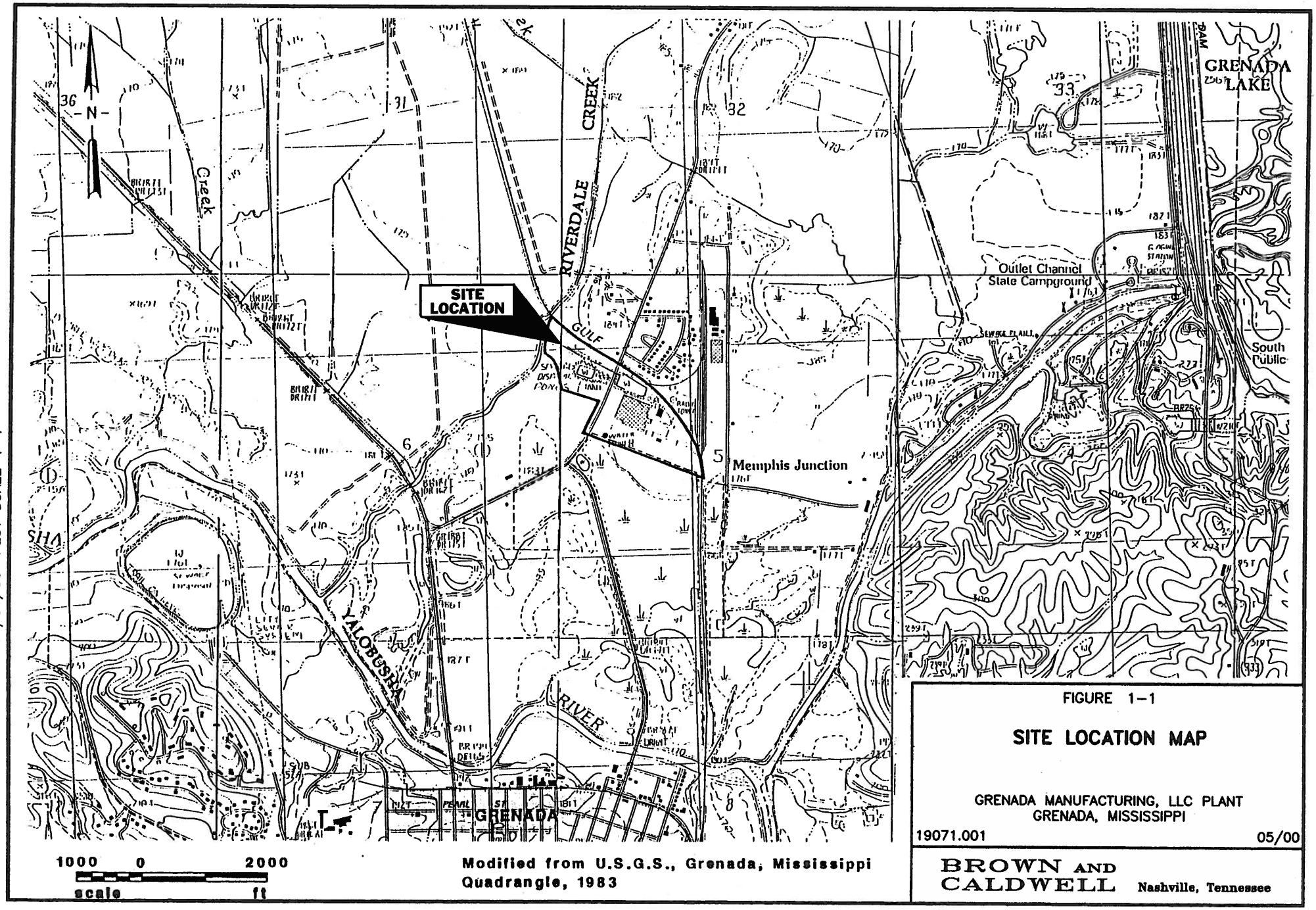
1.0 INTRODUCTION

This document contains the Interim Measures Work Plan for the Grenada Manufacturing, LLC facility (Site) located at 635 Highway 332, in Grenada, Mississippi (Figure 1-1). In accordance with the facility's Hazardous and Solid Waste Amendment (HSWA) Permit issued July 31, 1998, the facility is undergoing Resource Conservation and Recovery Act (RCRA) Corrective Action for prior and suspected ongoing releases of hazardous waste, including hazardous constituents from various solid waste management units (SWMUs). To that end, Interim Measures (IM) for the Site were required by the United States Environmental Protection Agency (USEPA) Region IV in its letter to Grenada Manufacturing dated April 11, 2000. According to the letter, the USEPA requests that the facility address site-wide groundwater contamination, as well as source removal and soil contamination for the following SWMUs and Areas of Concern (AOC):

- SWMU 12 – Wet Well Sump
- SWMU 14 – Chromium Destruct Pit
- SWMU 15 – Process Sewers
- AOC A – Former Trichloroethylene Storage Area
- AOC B – Former Toluene Underground Storage Area

Figure 1-2 identifies these SWMUs and AOCs in relationship to existing Site features.

A site visit and project meeting was held April 25 and 26, 2000. During the project meeting, it was agreed that interim measures at SWMU 12 would not be necessary. As discussed with USEPA and MDEQ, the Interim Measures Work Plan should address priority SWMUs 14 and 15; AOCs A and B; and Site-wide groundwater. SWMU 12 will be addressed indirectly through Site-wide groundwater interim measures. This agreement is addressed in a USEPA letter to Grenada Mfg. dated May 18, 2000. The May 18 letter also mentioned SWMU 13, the Wastewater Treatment Plant. However, this SWMU was noted in previous documents, including the April 11 USEPA letter, as not requiring interim measures. Therefore, SWMU 13 is not directly addressed by this Work Plan.



1000 0 2000
scale ft

Modified from U.S.G.S., Grenada, Mississippi Quadrangle, 1983

FIGURE 1-1

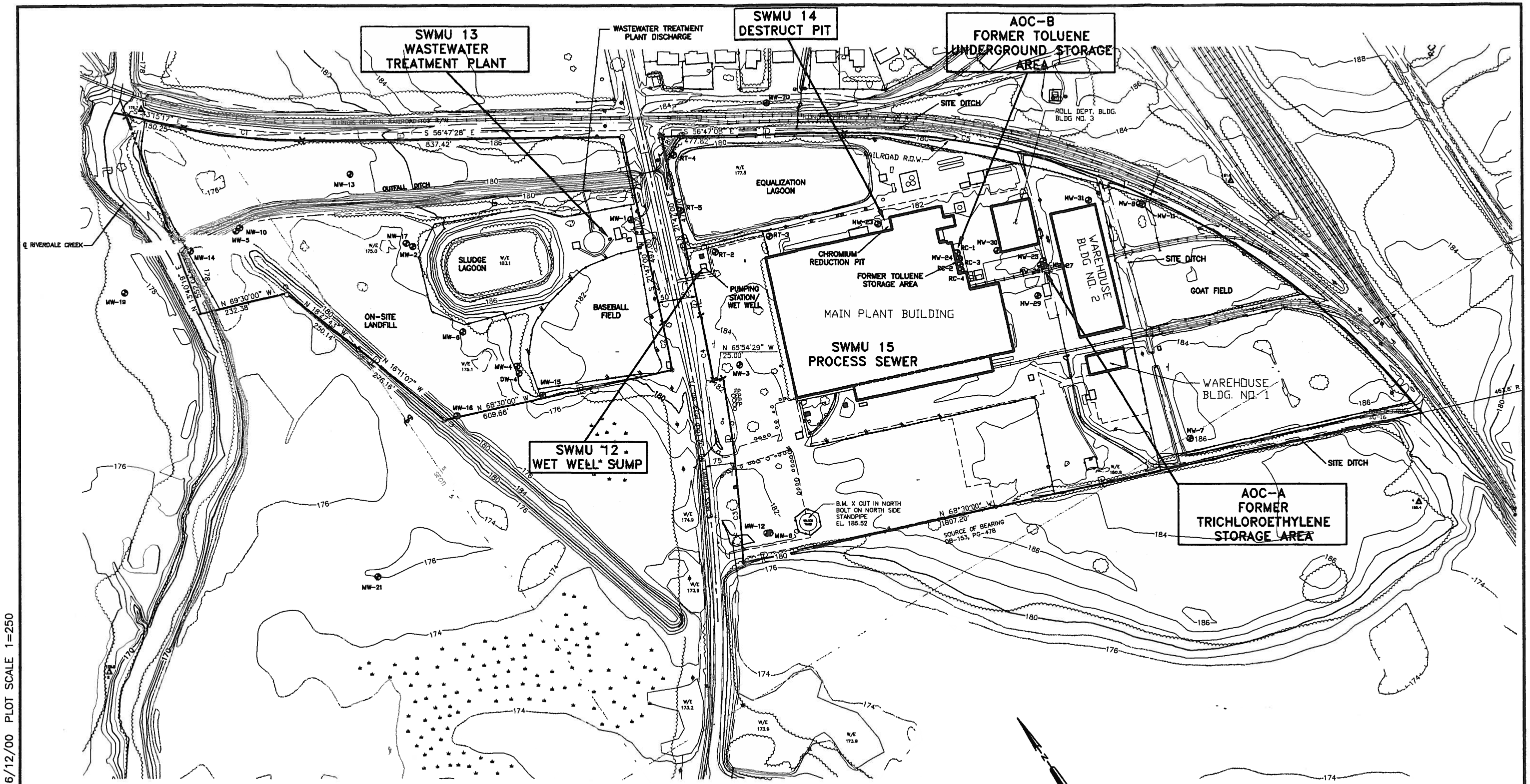
SITE LOCATION MAP

GRENADA MANUFACTURING, LLC PLANT
GRENADA, MISSISSIPPI

19071.001 05/00

BROWN AND CALDWELL Nashville, Tennessee

DRAWING NO.: 19071-00 DATE: 05/31/00 PLOT SCALE 1=1



SOURCE: SURVEY BASE MAP PREPARED BY ALMON ASSOCIATES, 1993. WELL LOCATIONS SHOWN ARE APPROXIMATE.

FIGURE 1-2
SITE MAP SHOWING LOCATIONS OF PRIORITY SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN
GRENADA MANUFACTURING, LLC PLANT
GRENADA, MISSISSIPPI
19071.001 5/00

BROWN AND CALDWELL Nashville, Tennessee

DRAWING NO.: 19071-03 DATE: 06/12/00 PLOT SCALE 1=250

1.1 PURPOSE

The purpose of this IM Work Plan is as follows:

- to present the objectives of proposed interim measures
- to identify and consider for further evaluation appropriate interim measures, including the need for additional data collection
- to demonstrate, at least from a conceptual level, how the interim measures will address releases and threatened releases
- to be consistent and integrated with the long-term, contemplated remedy for the Site.

The primary objective of the proposed IM is to minimize or prevent the further migration of contaminants and to limit actual or potential human and environmental exposure to contaminants while long-term corrective action remedies are evaluated.

Several potential interim remedies are identified herein and will be considered for further evaluation (under separate cover) in accordance with the appropriate USEPA standards and selection processes. Screening of applicable technologies in this document is limited to known site/waste characteristics and technology limitations. As discussed during the April 25 and 26, 2000 meeting, additional Site and technology-specific data is needed to assist with the remedy selection process. Therefore, this Work Plan includes a task-specific data collection and management plan. The plan describes procedures for direct push technology sampling, field measurements, and sample analyses to develop information, data, and resulting decisions that are technically sound and properly documented. The results of these data collection efforts will be presented in the forthcoming RFI Report.

A new Health and Safety Plan (HASP) will not be required for data collection. The activities proposed for additional data collection are similar to previous Site investigation activities performed during the RI in 1993/1994 and during the subsequent groundwater data collection performed as

recently as January 1999. The existing HASP will be utilized for the proposed work. Subcontractors hired to perform Site work will be required to have their own HASP and abide by all plant safety procedures.

This Work Plan also provides a limited discussion of the ability of the proposed IM to abate constituents released at the Site. A more detailed discussion of each of the IM expected performance will be included in an IM Study. The IM Study will also include the detailed evaluation and remedy selection process.

Following the IM Study and submittal of the RFI, a Draft Interim Measure Study Report will be provided to the USEPA and Mississippi Department of Environmental Quality (MDEQ) for review and approval. As necessary, the IM Study will be followed by construction plans and specifications and an operations and maintenance plan for design and implementation of the interim remedy, respectively. Implementation of the final IM will occur after the Final IM Design is completed.

1.2 DESCRIPTION OF CURRENT SITUATION

Rockwell Automotive North America, now Meritor Automotive, Inc. operated a wheel cover manufacturing facility in Grenada, Mississippi from 1966 to 1985 before selling the operations and property to Textron Automotive Company, formerly Randall Textron, who then sold the operations and property to Grenada Manufacturing, LLC in 1999. Grenada Manufacturing, LLC (Permittee) continues to operate the wheel cover plant. Meritor Automotive, Inc. and Textron Automotive Company have conducted a number of environmental investigations at the referenced facility. The most extensive investigative work is reported in the 1994 Remedial Investigation (RI) Report conducted by ECKENFELDER INC., now Brown and Caldwell (BC). The work was performed in response to a MDEQ administrative order on consent designed to investigate the on-site landfill, and was subsequently expanded to include other areas of the Site.

The RI conducted by ECKENFELDER INC. in January 1994 identified the presence of trichloroethylene (TCE) and its degradation products, as well toluene and chromium in the soil and groundwater at the Site. A Baseline Risk Assessment (BRA) was performed for soil and upper-site groundwater as part of the Supplemental RI report prepared by ECKENFELDER INC. in

March 1994. The baseline risk assessment provides an evaluation of the potential threat to human health and the environment of the constituents of interest at the Site. The risk assessment identifies the constituents of interest and, through the exposure and toxicity assessments, characterizes the associated potential risk, assuming no action is taken at the Site. The primary concern with respect to impacted groundwater is the migration of chlorinated ethenes and ethanes to Riverdale Creek. Toluene and chromium are also of concern, but are present at much lower concentrations than are the chlorinated VOCs and do not threaten Riverdale Creek. The results of that investigation are discussed on a site-wide basis in the RI report. The SMWUs and AOCs had not yet been determined at the time the report was submitted to the MDEQ.

Subsequent to the submittal of the RI report, the facility became subject to regulation under RCRA and a RCRA Facility Assessment (RFA) was performed by USEPA's contractor (A.T. Kearney, Inc., 1997) as part of the HSWA permit process for the facility in 1996 and 1997. As a result of the Preliminary Review (PR) and Visual Site Inspection (VSI), 26 SWMUs and 3 AOCs were identified.

On March 2, 1999, USEPA issued a combined RCRA Facility Investigation (RFI)/Confirmatory Sampling (CS) Work Plan call letter. Meritor and Textron requested a meeting at the Region IV office to review the results of the RI conducted for MDEQ and to identify potential data gaps. During a meeting held on May 13, 1999 among the USEPA Region IV Project Manager, and representatives from Textron Automotive, Meritor Automotive, and Meritor's consultant, BC, it was agreed that nearly all of the information that might be generated in an RFI/CS effort already existed. USEPA requested that summaries of data obtained subsequent to issuance of the 1994 RI report be prepared and that the available data be organized by SWMU or AOC. That document, the Summary of Investigative Work (SOIW), was prepared by BC in response to that request and was transmitted to USEPA and MDEQ in July 1999.

A large portion of the site's groundwater is currently impacted by TCE and its degradation products. Additionally, there is a significant portion of the Site where chromium impacts groundwater. Groundwater at the Site appears to discharge primarily directly to Riverdale Creek. Potential impact to the creek appears to be limited to TCE and its degradation products. Groundwater may also enter the outfall ditch, which discharges to Riverdale Creek. Impact to Riverdale Creek due to discharge of groundwater containing TCE and its degradation products has been identified as an

environmental condition that could significantly benefit from implementation of an Interim Remedial Measure.

There is one primary and a number of secondary potential source areas for TCE, some of which may not be easily accessed. Addressing hot spots particularly where dense non-aqueous phase liquid (DNAPL) may exist will have minimal impact on groundwater quality unless TCE removal/destruction exceeds 95 percent or possibly 99 percent. Unless all significant source areas are adequately treated, impact to groundwater is likely to continue. Currently, available technologies have not, in general, been able to meet this requirement. Thus, it is not likely that additional source area treatment on an interim basis would have near-term impact on the quality of groundwater reaching Riverdale Creek.

If a measure capable of preventing impact to Riverdale Creek is implemented, then the potential environmental impact from source areas, as well as the Site-wide plume, will be controlled. Thus, the focus of the identification and evaluation of Interim Remedial Measures will be on controlling the migration of groundwater impacted by TCE and its degradation products from reaching the creek (i.e., migration control).

1.3 RCRA COMPLIANCE SCHEDULE

Following the receipt of the USEPA letter dated April 11, 2000, a meeting was held on Site April 25 and 26, 2000 between representatives from Grenada Manufacturing, Meritor Automotive, MDEQ, the USEPA, and Brown and Caldwell to discuss, among other things, this Work Plan and USEPA's acceptance of the SOIW in lieu of the draft RFI report.

As stated in USEPA's letter, Grenada Manufacturing, LLC is also required to respond to comments on the SOIW and to revise and resubmit the SOIW as an RFI Report. Responses to comments on the SOIW will be transmitted with the RFI Report. As agreed during the project meeting on April 25 and 26, transmittal of the Interim Measures Work Plan and the RFI Report (revised SOIW) will be completed under separate schedules so that additional groundwater sampling and analyses can be performed as part of the implementation of this Work Plan. As such, Grenada Manufacturing, LLC requested a 30-day extension on submittal of the Interim Measures Work Plan

until June 14, 2000 and an extension on submittal of the Final RFI Report of 14 weeks following approval of the Interim Measures Work Plan.

Once USEPA and MDEQ approval is received on this Work Plan, field activities will be initiated within four weeks. Sampling is expected to take about one week and analytical results will be provided within about three weeks of sample receipt. The additional data will be incorporated into the RFI Report and the final report transmitted to the agencies within about six weeks of receipt of analytical data. Therefore, the Final RFI Report can be submitted within about 14 weeks of receipt of approval of the Interim Measures Work Plan.

The USEPA has approved the extension of this Work Plan and subsequent RFI Report. The remaining submittals noted in the Schedule of Compliance, included as Appendix D of the facility's existing RCRA Permit, are anticipated to follow the existing schedule. A copy of that schedule is included as Appendix B for reference.

2.0 PREVIOUS, ONGOING, AND PROPOSED SOURCE CONTROL MEASURES

A number of source control interim measures have been previously implemented at the Site. These measures include installation of a dense non-aqueous phase liquid (DNAPL) recovery system for trichloroethene (TCE), installation of a light non-aqueous phase liquid (LNAPL) recovery system for toluene, and ex-situ soil vapor extraction at an area designated as the on-site landfill. Grenada Mfg. expects to continue NAPL recovery as an interim measure. In addition, the Former Equalization Lagoon was closed under the oversight of MDEQ. The facility also expects to implement another source control measure; specifically, shutdown of the existing chrome plating operation. Each of these measures is briefly discussed in this section.

Each of the source control measures discussed in this section will be further evaluated as part of the IM Study. As discussed in Section 1.0, source control interim measures discussed in this Work Plan will address priority SWMUs 14 (Chromium Destruct Pit) and 15 (Process Sewers), and AOCs A (Former TCE Storage Area) and B (Former Toluene Underground Storage Area). Previously performed source control measures have been successful in terms of meeting their intended objectives. However, ongoing source control measures, such as the NAPL recovery systems, must also be evaluated as part of the IM Study. This evaluation will address whether additional efforts are necessary, including continuing current operations or modifying those systems. Proposed additional source control measures (i.e., closure of the Chromium Destruct Pit and evaluation of the Process Sewers) will also be evaluated as part of the IM Study. In addition to the ongoing and proposed source control IM presented in this Work Plan, IM associated with Site-wide groundwater corrective action will also be evaluated.

Additional data have been obtained during various post-closure activities and in conjunction with interim measures. These data are documented in several reports, which have been previously submitted to the USEPA and/or MDEQ. However, current Site information is insufficient to complete the evaluation of interim measures. Therefore, additional data collection is proposed as part of this evaluation. Specifically, additional soil and groundwater data will be collected. The results from the additional data collection efforts discussed in Section 4.0 of this Work Plan will be utilized to evaluate which interim measures may be necessary.

2.1 PREVIOUS SOURCE CONTROL MEASURES

An interim measure was previously implemented at the Site in 1994 from one area immediately northwest and a second smaller area immediately south of the existing sludge lagoon designated as the "on-site landfill". That interim measure used ex-situ soil vapor extraction to treat approximately 9,000 cubic yards of soil. TCE impacted soil was removed and mixed with aggregate and lime using a road stabilizer fitted with an off-gas treatment system. Treated soil was then stockpiled, and when verified as meeting cleanup goals, returned to the excavation.

Additionally, the Former Equalization Lagoon that had been located northeast of the main building was closed under the jurisdiction of the MDEQ. In general, the closure activities consisted of the draining of the lagoon and removal and temporary consolidation of sludge and underlying soil within the eastern portion of the drained lagoon. An engineered liner was then constructed within the western portion of the lagoon and the sludge and underlying soil was placed within the lined area. An engineered landfill cover system was then constructed over the area. Lastly, the eastern portion of the former lagoon was allowed to refill with surface water runoff. Textron has sampled and analyzed samples from the groundwater compliance monitoring wells surrounding the Former Equalization Lagoon and of the Wastewater Treatment Plant effluent. The results of those efforts were described in the SOIW.

2.2 ONGOING SOURCE CONTROL MEASURES

Two ongoing interim remedial activities resulted in the removal of approximately 570 gallons of TCE and 2,000 gallons of toluene from free product recovery systems located between the main plant building and the warehouse located to the east.

The DNAPL recovery system was installed in October 1993. The DNAPL recovery well is located between the plant building and the plant warehouse to the east in vicinity of the former trichloroethene (TCE) storage tank. TCE is no longer used at the plant. The automated DNAPL recovery system was operated for a period of approximately three years until the system was no longer able to recover significant amounts of free-phase TCE. Currently, manual bailing is used to

recover residual amounts of DNAPL and it is anticipated that this recovery activity will continue. Further evaluation of the existing DNAPL recovery system will be addressed as part of the IM Study. This evaluation will include continued operation, modified operation, or discontinuing operation.

The automated LNAPL recovery system was also installed in October 1993 to recover free phase toluene. Toluene use is currently limited to painting activities in an isolated area of the plant requiring only small containers. The LNAPL recovery system operated for a period of about two years and consisted of four wells located immediately behind the main building in the former area of the toluene underground storage tank. Currently, residual toluene is being recovered manually and it is anticipated that this recovery activity will continue. Further evaluation of the existing LNAPL recovery system will be addressed as part of the IM Study. As with the DNAPL recovery, this evaluation will include continued operation, modified operation, or discontinuing operation.

2.3 PROPOSED SOURCE CONTROL MEASURES

USEPA requested that closure of the Chromium Destruct Pit be included in the IM Work Plan. The chrome plating department is composed of three chrome-plating lines with 11 tanks in each line. The lines are each in a recessed area, three feet below the plant floor. At the beginning of each line, wheel covers are manually removed from the conveyor belt from the butler wash tank and placed on long rods that are dipped into each of the 11 tanks. The recessed in-ground plating lines are sloped to the Process Sewers (SMWU 15) so that the overflow from the tanks in the north half of each chrome line (tanks one through six) drain to the Wet Well (SMWU 12). These tanks do not contain any chromium. The tanks in the south half (tanks 7 through 11) of each line contain chromium, and the overflow from these tanks drains to the Chromium Destruct Pit (SMWU 14).

Since the Chromium Destruct Pit is an integral part of the chrome plating operation, one of two conditions must be met prior to the destruct pit being closed:

1. A sump must be created in the floor of the plating lines to collect water to be pumped to a holding tank for reclamation through the chrome recovery system. Creation of a sump in the floor of the plating lines would potentially destroy the integrity of the floor. This

might allow contaminated water to seep into the soil under the lines and migrate into the groundwater. Therefore, this is not considered an appropriate course of action.

2. Plating operations must cease prior to closure of the destruct pit. Cessation and outsourcing of the plating operations appears to be the most promising alternative. Grenada Mfg. has been pursuing outsourcing the plating operations since the summer of 1999. To date, no vendor has been located that can satisfy both financial and customer stipulated limitations of the project. Therefore, this alternative cannot be placed into effect at this time.

To address the USEPA request to move forward while satisfying customer requirements, Grenada Mfg. proposes the following:

1. Grenada Mfg. will continue to actively pursue a suitable vendor.

2. Grenada Mfg. will cease plating operations within 90 days of location and customer approval of a suitable vendor.

3. Grenada Mfg. will cease use of the Chromium Destruct Pit and submit a Closure Plan within 60 days of cessation of plating operations.

The above plan will allow for timely closure of the destruct pit, while allowing Grenada Mfg. to meet its obligations to its customers.

3.0 IDENTIFICATION AND SCREENING OF INTERIM MEASURE TECHNOLOGIES

3.1 SOURCE CONTROL MEASURES

As stated in Section 2, source control interim measures will be evaluated as part of the IM Study. NAPL recovery activities at AOC A (Former Trichloroethylene Storage Area) and AOC B (Former Toluene Underground Storage Areas) will be re-evaluated as part of the study. The IM Study will evaluate the additional data collected as part of this Work Plan to help focus any additional source control activities that may be necessary. Consideration will be given to continuing current operations, modification of the existing systems, and potentially discontinuing recovery operations if it is determined that recovery is no longer meeting objectives given the amounts of NAPL being recovered.

SWMUs 14 (Process Sewers) and 15 (Chromium Destruct Pit), including potential air releases from these areas of the plant, will be further evaluated as part of the IM Study. As discussed during the April 25 and 26, 2000 meeting, it is doubtful that additional air monitoring will be necessary since recent air monitoring data obtained from the area during plant expansion activities is reportedly, below levels of concern. In addition, TCE air emissions associated with the existing chrome plating operations will be significantly reduced.

Currently, not enough data exists to determine what additional source control measures should be utilized, if any, to address the Process Sewers and Chromium Destruct Pit. The IM Study will consider the additional data collected as part of this Work Plan to help focus any additional source control activities that may be necessary. Potentially applicable source control measures for the Process Sewers include slip-lining the existing below ground piping still being used or filling the pipes with concrete and installing aboveground piping. Potentially applicable source control measures for the Chromium Destruct Pit will include closing the pits. However, such measures would more likely be incorporated into and implemented as part of an overall or long-term change in operations to be decided by Grenada Manufacturing (see Section 2.3).

3.2 GROUNDWATER INTERIM MEASURES

Potentially applicable groundwater IM are those that minimize impacted groundwater from entering Riverdale Creek or those that could remove or destroy constituents of concern so that groundwater entering the creek does not exceed cleanup concentration goals for each constituent. Based on available data, the groundwater constituents that are currently impacting the creek are TCE and its daughter products cis-1,2-dichloroethene (cis-DCE) and vinyl chloride (VC).

Several groundwater remediation technologies have been developed and implemented to address volatile organic compounds (VOCs) in groundwater. These include technologies that have been applied at numerous sites for many years, as well as more innovative technologies that offer performance and cost advantages over more traditional technologies. The following are representative of technologies that have been used at other sites to address VOCs in groundwater and are anticipated to be considered for the Interim Measures Study at this Site.

Pump and Treat: This traditional method uses groundwater recovery (trenches or wells), treatment of the extracted groundwater, discharge to surface waters, reinjection to groundwater, or discharge to a POTW. These systems typically accomplish little source area remediation, but can serve to prevent further downgradient migration.

Air Sparging: This technology has been used for several years. Air is injected into the aquifer through wells screened over a short interval, typically over the bottom few feet of the saturated interval. Injected air transfers dissolved phase VOCs to the vapor phase as the air travels in channels through the saturated soil. In general, capture of the vapors is accomplished through soil vapor extraction systems, which apply a partial vacuum to wells screened within the unsaturated zone or in trenches. Air captured in this manner is treated and discharged to the atmosphere.

Zero Valence Metal Permeable Barriers: A zero valence metal, typically iron filings, is placed in a trench which intercepts the groundwater plume. Chlorinated organic compounds are reduced to non-chlorinated compounds (e.g., TCE is converted to ethene). Additionally, chromium (+6) is converted to chromium (+3). Systems can be configured as funnels and gates or as continuous trenches.

Anaerobic Biodegradation Zones: Anaerobic zones in which microbial based reductive dechlorination can be created by the addition of electron donors such as molasses, lactic acid, hydrogen, or slow release hydrogen compounds. These zones can be created by introducing the electron acceptor as a liquid through a row of injection wells. Hydrogen can be introduced through a row of sparging wells. Slow release hydrogen compounds can be introduced under pressure as a viscous liquid using a Geoprobe® or equivalent system. In each method, the oxidation/reduction potential is lowered to promote microbial enhanced reductive dechlorination (e.g., TCE is converted to cis-DCE, which is concerted to VC and, finally, to ethene). A novel variation on this is to introduce food-grade oil, which serves to both adsorb the VOCs from groundwater and to act as a long-term supply of electron donors.

Chemical Oxidation: Introduction of a strong oxidant results in the conversion of compounds like TCE to carbon dioxide, water, and chloride ion. Potassium (or sodium) permanganate or Fenton's reagent (hydrogen peroxide with an iron catalyst at low pH) is introduced in a liquid form through a series of injection wells. Ozone can be introduced by sparging or dissolved in water prior to injection into the formation.

Monitored Natural Attenuation: Natural attenuation relies on dilution mechanisms and destruction mechanisms (i.e., biodegradation and chemical reactions). Natural attenuation has been demonstrated to limit plume size and, in some cases, remediate plumes. USEPA and others have developed protocols for evaluating monitored natural attenuation (MNA). MNA requires a detailed study of groundwater quality and geochemistry, aquifer hydrogeology, and risk factors, as well as a long-term monitoring plan. A contingency plan should be developed should MNA not be adequate for the Site. Typically, MNA is implemented in conjunction with source control measures.

These technologies and, potentially other applicable technologies, will be further evaluated based on their ability to prevent migration of TCE and its degradation products from reaching Riverdale Creek.

Other groundwater remediation technologies are considered inappropriate for either the constituents of interest or the Site conditions. For example, thermal desorption methods, either

steam or six phase heating, are more appropriate for source areas and would be difficult to implement because of the Site geology (specifically, several feet of dense, wet clay over the sandy aquifer). Similarly, surfactant or alcohol flushing is more appropriate for source areas where NAPL and adsorbed phases exist than for plumes where most of the constituent mass is already in the dissolved phase. Other technologies that might be considered to address residual constituent mass in the unsaturated zone are not appropriate for the dense, wet clay soil found in the upper several feet at the Site. Soil vapor extraction requires more permeable unsaturated soil than exists at the Site. Previous work at the Site has demonstrated that soil vapor extraction is not practical for the Site.

3.3 TECHNOLOGY SCREENING

The technologies discussed in Sections 3.1 and 3.2 appear from an initial review to be appropriate for the constituents of interest and the Site conditions, and may be considered for further evaluation. For each interim remedy that warrants a more detailed evaluation, the following criteria will be used in the development and selection process:

- protect human health and the environment
- long-term reliability and effectiveness
- reduction in the toxicity, mobility or volume of wastes
- short-term effectiveness
- implementability
- cost
- control the source of releases so as to reduce or eliminate, to the extent practicable, further releases that may pose a threat to human health and the environment

- comply with applicable standards for management of wastes.

These criteria will be utilized in the detailed evaluation to be presented in the IM Study following collection of the additional data discussed in Section 4.0.

Selection of one or more of the technologies will be based on the Site-specific conditions, e.g., groundwater velocity, concentrations of constituents of concern, depth to water, Site-specific groundwater target levels, thickness of the saturated interval, aquifer heterogeneity, distance to receptors, cost, and access to the surface.

Compatibility with other technologies that might be used at the Site also is a critical factor in selecting an IM. For example, if the IM is based on reduction of TCE to ethene, it will be problematic to use a technology upgradient of such a barrier if the upgradient system is based on oxidation. For this reason, the IM selection process must anticipate potential source area remedies. For this Site, we have anticipated that following implementation and testing of a migration control system it may be beneficial to apply a technology upgradient, most likely in one or more source areas, that would be at least compatible and preferably synergistic with the barrier. An example would be a zero valence metal barrier with introduction of an electron donor to address the plume upgradient of the barrier. Thus, groundwater reaching the barrier would have a lower oxidation/reduction potential; as well as lower concentrations of constituents. Subsequently, the barrier might perform better and/or last longer.

4.0 DATA COLLECTION AND MANAGEMENT

Currently, there is insufficient information to select final Interim Measures. Specifically, more detailed information is needed regarding the horizontal and vertical distribution of VOCs, and possibly chromium (+6), at potential locations for the Interim Measures. This data could be provided through a sampling program using direct push methods. Additionally, the same sampling event should be used to define the top and bottom of the shallow aquifer as the thickness of the saturated interval and the depths to groundwater and the aquitard are important considerations in selecting a technology with respect to feasibility of construction methods. Further, existing data should be used to model groundwater flow, as the seepage velocity is critical to performance feasibility of some technologies. Additional soil data from the Site, including any of the SWMUs, would not be beneficial because they are all located substantially upgradient of the likely locations of the IM. Furthermore, in some cases it would be difficult to assess whether constituents found in soil samples evolved from the SWMU or as a result of groundwater transport from an upgradient source.

The additional sampling event proposed in conjunction with the RFI will include sampling and analysis of existing monitoring wells site-wide to provide current data regarding the distribution of key constituents in groundwater and will help identify trends in constituent concentrations throughout the plume. However, this data will not provide further delineation of areas in the vicinity of where an Interim Measure system might be implemented. It will be important to extend the delineation (utilizing direct push technology) of TCE and its daughter products in two areas; extending south from the outfall ditch along Riverdale Creek and between the creek and the sludge lagoon. Both vertical and horizontal delineation are needed to select and design an IM. For example, zero valence metal barriers require sufficient retention time to achieve adequate reductions in constituent concentrations. The needed retention time depends upon the degradation rates and the concentrations of constituents entering the treatment system. The retention time achieved is dependent upon the groundwater seepage velocity and the thickness of the treatment system. These factors can determine whether such a system is appropriate for a specific Site or specific area of the Site. No long-term groundwater monitoring is proposed for that area at this time. Once an IM has been selected, a long-term groundwater monitoring program will be designed to meet the monitoring needs of the IM.

4.1 GROUNDWATER AND SOIL SAMPLING

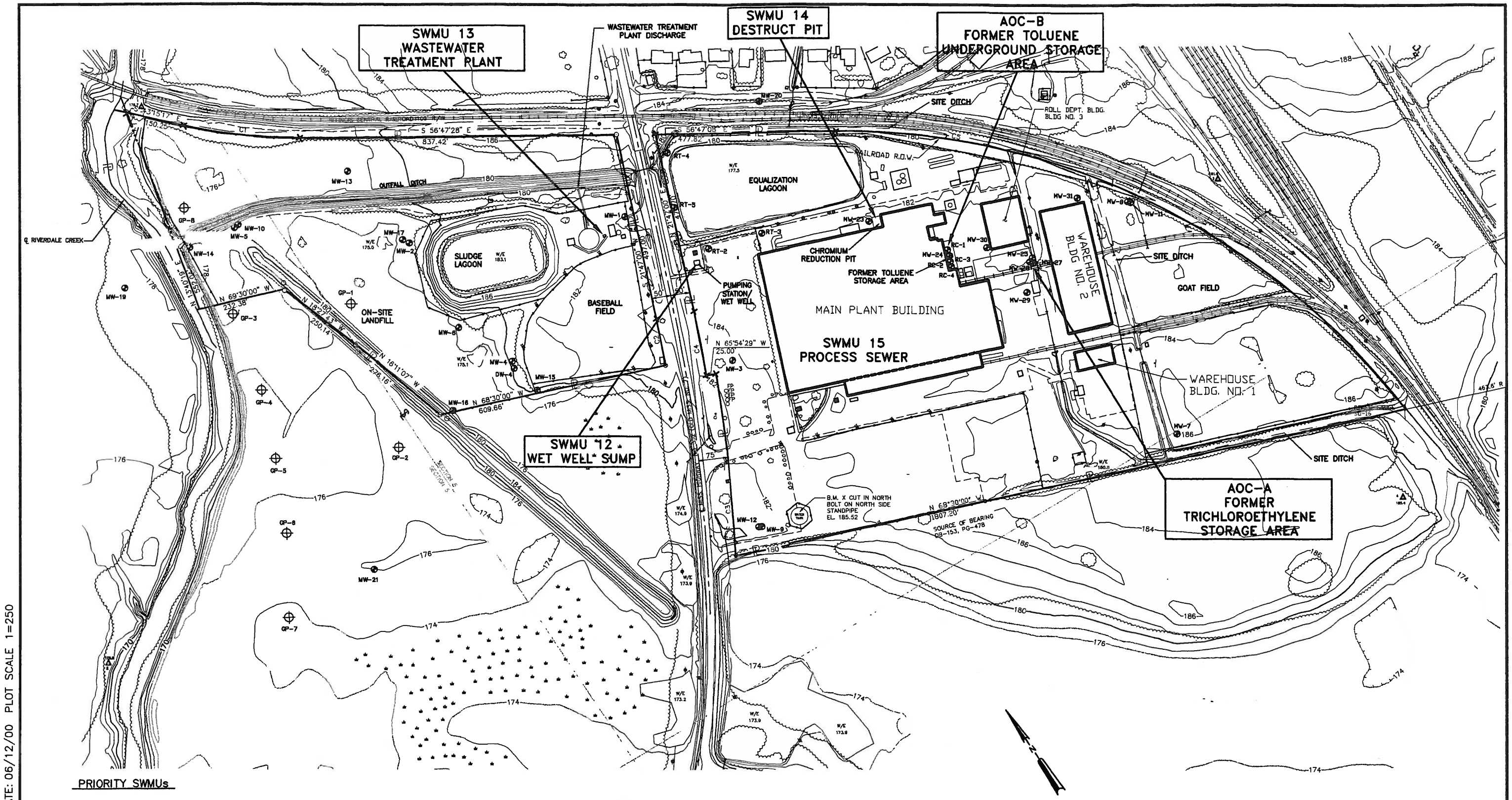
Groundwater sampling using direct push technology such as Geoprobe® will be conducted to provide additional data to supplement the interim measures evaluation. The objective of the Geoprobe® groundwater sampling is to determine the lateral and vertical extent of the groundwater plume along Riverdale Creek. Eight Geoprobe® sampling locations (see Figure 4-1) will be used to meet data needs. Two groundwater samples will be collected from each location. One groundwater sample will be collected for the upper ten feet of the water table aquifer (approximately 20 feet) and the second sample will be collected from the lower portion of the aquifer (approximately 45 feet).

One-inch piezometers will be installed at two locations to better define the groundwater flow direction and gradients in the vicinity of an immediately upgradient of Riverdale Creek. The piezometers will be installed using direct push methods within the upper portion of the water table aquifer, approximately 25 feet. Each piezometer will be completed with a 4-inch diameter locking steel protective casing and surveyed for horizontal and vertical control. Two groundwater elevation measurement events will be performed utilizing the newly installed piezometers and select Site wells (approximately 25 locations). The initial event will be completed during the direct push installation activities, while the second event will be completed about two weeks later.

Continuous soil cores will be collected from GP-4, GP-6, and GP-7 to define the top and bottom of the shallow aquifer. The thickness of the saturated interval, and the depths to groundwater and the aquitard are important considerations in selecting a technology with respect to feasibility of construction methods. The groundwater samples and soil cores will be collected in accordance the Sampling and Analysis Plan (SAP) presented in Appendix A.

4.2 ADDITIONAL GROUNDWATER SAMPLING

During the meeting held at Grenada Manufacturing on April 25 and 26, 2000 the results of previous investigations and interim measures were discussed. The USEPA, MDEQ, Grenada Mfg., Meritor, and BC agreed that additional groundwater sampling would be performed to update the



PRIORITY SWMUs

12–WET WELL
13–WASTEWATER TREATMENT PLANT
14–CHROME DESTRUCT PIT
15–PROCESS SEWERS

PRIORITY AOCs

A–FORMER TRICHLOROETHYLENE STORAGE AREA
B–FORMER TOLUENE UNDERGROUND STORAGE AREA

LEGEND

- Monitoring Well (MW–15)
- Recovery Well (RC–3)
- Geoprobe Location

250 0 250 500
SCALE FEET

SOURCE: SURVEY BASE MAP PREPARED BY ALMON ASSOCIATES, 1993. WELL LOCATIONS SHOWN ARE APPROXIMATE.

DRAWING NO.: 19071-04 DATE: 06/12/00 PLOT SCALE 1=250

FIGURE 4–1

GEOPROBE LOCATION MAP

GRENADA MANUFACTURING, LLC PLANT
GRENADA, MISSISSIPPI

19071.001 5/00

BROWN AND CALDWELL Nashville, Tennessee

groundwater database and incorporate the updated information into the RFI Report (revised SOIW). Accordingly, a site-wide groundwater-sampling event will be conducted to supplement the interim measure study and update the RFI. Twenty-five (25) monitoring wells will be sampled and analyzed for VOCs, SVOCs, TAL metals, and hexavalent chromium to assess current groundwater quality at the Site. Table 4-1 presents a list of the monitoring wells to be sampled. The locations of the monitoring wells are presented on Figure 4-2. The methods and procedure that will be followed to conduct the groundwater sampling are presented in Appendix A.

4.3 PROJECT MANAGEMENT

4.3.1 Project Organization and Management

Mr. John Bozick is the Project Manager for Meritor, Inc. Mr. Bozick has the overall responsibility for coordinating work activities at the Site; interfacing with Grenada Mfg., Textron, and the Brown and Caldwell Project Manager; and communicating with the USEPA and MDEQ.

BC has been retained by Meritor to evaluate interim measures and to collect additional site information. The BC Project Manager, Dale R. Showers, P.E., will be responsible for coordinating technical activities and directing BC personnel on the project, and will be the primary BC contact. Robert E. Ash, IV, P.E., of BC will act as the Principal in Charge with responsibility for the overall quality of the work. Project related activities will be managed by Mr. Showers from the BC Nashville, Tennessee office. BC personnel will be responsible for the establishment and monitoring of schedules, coordination of field activities, managing data, and performance of subcontractors. BC personnel will interface with subcontractors, laboratory and project personnel, and inform the Project Manager of all activities.

4.3.2 Document Control

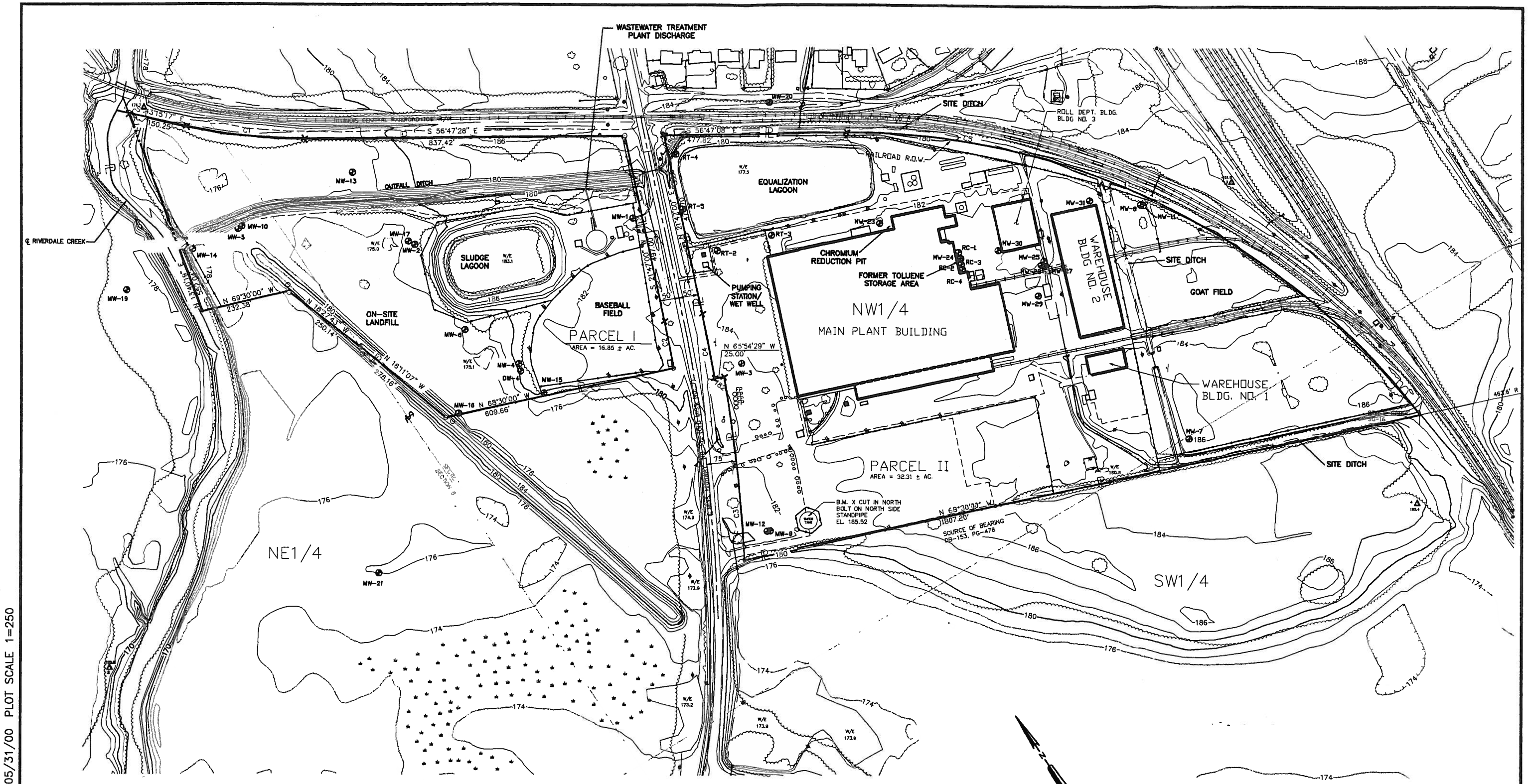
Project documents will be controlled through an organized project filing system. Project and task numbers will be printed on each document. Analytical/technical files will include work products generated during the project. Field books, field observations, photographs, and other field related documents will be prepared and will also be placed in the project files. Laboratory sample results will be controlled, reviewed, and validated as defined in the original Quality Assurance Project Plan (QAPP) (ECKENFELDER INC., June 1991) developed for the RI and updated, as necessary. Original incoming documents will be date-stamped upon arrival and will be placed in the files.

Table 4-1. Interim Measures Work Plan – Monitoring Well Network

Grenada Manufacturing Site
Grenada, Mississippi

Well Name[a]
MW-1
MW-2
MW-3
MW-4
MW-5
MW-6
MW-7
MW-8
MW-10
MW-11
MW-12
MW-13
MW-14
MW-15
MW-16
MW-17
MW-20
MW-23
MW-24
MW-25
RT-1
RT-2
RT-3
RT-4
RT-5

[a]Refer to Figure 4-2 for well locations.



LEGEND

● Monitoring Well

250 0 250 500
SCALE FEET

SOURCE: SURVEY BASE MAP PREPARED BY ALMON ASSOCIATES, 1993. WELL LOCATIONS SHOWN ARE APPROXIMATE.

FIGURE 4-2

MONITORING WELL LOCATION MAP

GRENADA MANUFACTURING, LLC PLANT
GRENADA, MISSISSIPPI

19071.001 5/00

BROWN AND CALDWELL Nashville, Tennessee

DRAWING NO.: 19071-01 DATE: 05/31/00 PLOT SCALE 1=250

4.3.3 Data Management

Data received from the field, analytical laboratories, subcontractors, or private sources will be tabulated on a spreadsheet or database and will be subjected to quality control procedures, including comparing raw data to the original source, verifying calculations, and confirming data summaries. Data distribution will not occur until data review has been completed. Maps or drawings created using the data will be subjected to the review process.

Work products will be checked before final use. This includes checking calculations, reports, plans, etc. with various levels of review. The Project Manager will be responsible for the review of work as an element of his project responsibilities. The Principal-In-Charge is responsible for the overall quality of the work. One or more discipline-specific Technical Directors may be assigned by the Project Manager. Further, assignments may be made outside the project team, as needed, for quality control purposes; for example, utilizing personnel experienced in the monitoring and evaluation of natural attenuation data.

5.0 IMPLEMENTATION OF INTERIM MEASURES

As indicated previously, some interim measures have been completed (on-site Landfill), while others are ongoing (NAPL recovery). Additional interim measures are expected to be implemented in the near future. These additional measures include shutdown of the chrome plating line and installation of groundwater interim measures. In general, the following tasks are planned as part of implementation:

- site-wide groundwater sampling and analysis
- supplemental groundwater and soil core sampling and analysis
- hydraulic monitoring
- interim measures study
- submit interim measures study report.

As stated in Section 1.0, the groundwater and soil sampling will be performed subsequent to receiving approval of this Interim Measures Work Plan. Data obtained from the field tasks will be utilized in the performance of groundwater modeling. The modeling results will, in turn, be used as part of the evaluation process in the interim measures study. Analytical results will also be used in the interim measures study, as well as in the preparation of the RFI Report. The RFI Report is expected to be completed and transmitted to the agencies within about 14 weeks of approval of this work plan.

The Interim Measures Study Report will follow, as appropriate, the outline provided in the HSWA permit for the Corrective Measures Study. An example of the anticipated outline is provided here as Table 5-1. The report will also address the design, schedule, permitting, and cost requirements for the selected interim measures. Transmittal of the Interim Measures Study Report is expected to follow the same schedule as the RFI Report.

TABLE 5-1

EXAMPLE OUTLINE FOR INTERIM MEASURES STUDY REPORT
GRENADA MANUFACTURING SITE
GRENADA, MISSISSIPPI

APPENDIX A

SUPPLEMENTAL SAMPLING AND ANALYSIS PLAN

SUPPLEMENTAL SAMPLING AND ANALYSIS PLAN

The additional groundwater and Geoprobe® samples will be conducted by the methods and procedures in the following sections.

1.0 Groundwater Sampling

Each of the wells at the Grenada site will be sampled according to the following procedures:

- The depth to static water level and the total depth will be measured in the well using a hand-held electric water level indicator.

- The volume of standing water in the 2-inch diameter well will be calculated using the following formula:

  $V = 0.164h$

  where:

  V = volume of water (in gallons)
  h = length of water column (in feet)

- A submersible pump or a dedicated/disposable Teflon® bailer will be used to purge a minimum of three standing well volumes from the well prior to sample collection. Purged water will be measured for pH, temperature, oxidation-reduction potential (ORP) and specific conductance to ensure that relatively stable values (i.e., values within 10 percent of previous readings) for these parameters have been achieved prior to sampling.

- When the aforementioned criteria have been satisfied, groundwater samples will be collected in the appropriate, properly labeled sample containers. VOC samples will

be collected using dedicated/disposal Teflon® bailers whereas other parameters will be sampled using the submersible pump.

- The samples will be kept on ice immediately upon collection and thereafter during shipment to the laboratory and until analyses are performed. The samples will be shipped using proper chain-of-custody procedures.

A portion of the groundwater collected during the sampling procedures will be field tested for temperature, specific conductance, ORP, and pH.

Temperature will be measured first using a thermometer accurate to the tenth of a degree and the value recorded in the field logbook. The thermometer will be rinsed with deionized water and stored in a plastic carrying case for transport to other sampling locations.

The specific conductance and ORP will be measured using a probe that is field calibrated. The probe will be placed in the sample, readings obtained, and then the value recorded in the field logbook. The probe will be decontaminated between samples with a deionized water rinse and placed in a field carrying case.

The pH will be measured with a pH meter that is field calibrated to standards with pH values of 4.0, 7.0, and 10.0. The clean probe will be inserted into the sample container, the reading recorded in the field log book to the nearest 0.1 pH unit, and the probe rinsed with deionized water and inserted into its carrying case.

The probes will be calibrated daily prior to sampling events. Calibration will be conducted according to manufacturer's specifications.

In addition to temperature, pH, ORP, and conductivity, field analyses will also involve the use of field kits to measure carbon dioxide, iron (II), manganese (II), hydrogen sulfide, and dissolved oxygen. The procedures for each of these field analyses vary and will be performed in accordance with the associated operating manuals from the manufacturer.

During each sampling event, the 25 groundwater samples will be accompanied by 2 duplicate samples, 1 equipment blank, and trip blanks (one per shipment) to be analyzed for quality assurance/quality control (QA/QC). Procedures for collection of these samples are as follows.

Duplicate samples will be collected at the same time and location as field samples. Duplicates will be evenly split from the same bailer load and equally proportioned into each receptacle for the split duplicate. Sample containers will be labeled such that laboratory personnel are not aware that they are analyzing duplicate samples.

Equipment blanks are intended to assess the potential introduction of contamination during sample collection, handling, and analysis and will be obtained in a fashion that approximates sampling procedures used in the field. Distilled/deionized water will be poured into randomly selected clean bailers or pumps that are used for monitoring well sampling and collected in the appropriate containers for the specified analysis. The samples will be handled and transported as are other groundwater samples.

Trip blanks are used to assess contamination caused by sample handling, transportation, storage, and shipping procedures. Trip blanks will be prepared by the laboratory by placing distilled/deionized water into appropriate sample containers, transporting them to the field, and handling them in the same manner as other samples collected during daily field sampling operations.

The types of containers, preservation methods, and holding times for the various laboratory analyses are prescribed by the laboratory in accordance with USEPA methods and are presented in Table A-1. Holding times will be measured from the time of sample collection. CLP analytical reports will be required since this data will be used to support the finalization of the RFI for the site.

Sample labels will be placed on all samples and will contain the following information:

- date and time of sample collection

TABLE A

ANALYTICAL METHODS AND COLLECTION REQUIREMENTS
AQUEOUS SAMPLES

PARAMETER	ANALYTICAL METHOD INFORMATION [a]				COLLECTION REQUIREMENTS		
	EPA No. [b]	SW846 No.	Holding Time[c]	Detection Limit (mg/L) [d]	Sample Volume Required [e]	Container Type	Preservation Technique [f]
Semi-Volatiles (BNA)	625 [h]	8270[c]	7 days/ 40 days[g]	1.0-10 µg/L	1000 mL	Glass Amber, Teflon Lid	Cool to ≤4° C $Na_2S_2O_3$ for chlorinated sample
Volatiles	624 [h]	8260[b]	14 days	0.1-1.0 µg/L (low level)	3 40-oz. vials, No Headspace	Glass Vials, Teflon Lined Septum Cap	HCL to pH<2 Cool to ≤4° C Ascorbic Acid for chlorinated sample
Metals	200.7	6010[b]	6 months	0.001 - 2.0	200 mL	Plastic	Filtered on site HNO_3 to pH <2
Hexavalent Chromium	NA	7196	24 hours	0.025 mg/L	200 mL	Plastic	Cool to ≤4° C

NA = Not Applicable

[a] If specific methods, detection limits, QC and/or reporting requirements, etc. are not specified, the Laboratory will utilize its best professional judgment in processing the samples.

[b] EPA Methods for Chemical Analysis of Water and Wastes.

[c] The times listed are the maximum times that samples may be held before analysis begins.

[d] Detection limits listed are typical laboratory method detection limits. These are subject to change and may vary based on sample volume, matrix interferences, high concentration of analytes, etc. Units are mg/L unless specified otherwise.

[e] These are typical volumes. In some cases may be able to perform analyses with less sample volume however detection limits are subject to increase. Laboratory will always request extra volume (if available) in case of breakage, reanalysis, dilutions, QC requirements, etc. Certain analytes with the same collection requirements may be combined upon collection and analyzed from the same container.

[f] Sample preservation should be performed immediately upon sample collection.

[g] The time listed is for the maxium time that sample extracts may be held before analysis begins.

- sample location
- sample number
- analysis to be performed
- sampler's name.

The field logbooks used during sampling procedures will include the following information:

- date and time
- sampling location
- static water level (depth to water)
- depth to bottom of the well
- calculated well volume
- actual evacuation volume and time
- analyses to be performed
- preservation method
- field meter calibration information
- general remarks (weather conditions, etc.).

All entries will be made in indelible ink with a ballpoint pen and will be written legibly. Entry errors will be crossed out with a single line, dated, and initialed by the person making the correction. Field logbooks will be reviewed periodically by the Task Manager, as appropriate.

A chain-of-custody form will be completed after sample collection and master field log documentation. The chain-of-custody forms will accompany the samples to the laboratory. The field personnel collecting the samples will be responsible for the custody of the samples until transportation to the laboratory. Sample transfer will require the individuals relinquishing and receiving the samples to sign, date, and note the time on the chain-of-custody forms.

2.0 Direct Push Sampling

Geoprobe® groundwater sampling will be conducted to provide additional data to supplement the interim measures evaluation. The objective of the Geoprobe® groundwater sampling is to determine the lateral and vertical extent of the groundwater plume along Riverdale Creek. Eight Geoprobe® sampling locations (see Section 4.0) will be used to meet this data need. Two groundwater samples will be collected from each location. One groundwater sample will be collected for the upper ten feet of the water table aquifer (approximately 20 feet) and the second sample will be collected from the lower portion of the aquifer (approximately 45 feet). Additionally, soil samples will be collected from GP-4, GP-6, and GP-7 to determine the elevation of the top of the aquitard.

Groundwater samples will be collected with a direct push sampler. A decontaminated direct push sampler will be driven to the desired sampling depth. The sampler barrel will be retracted to expose the sampler screen allowing groundwater to flow into the sampler. A peristaltic pump with tygon tubing will be used to purge approximately three sampler volumes. Once the sampler has been purged, a groundwater sample will be collected through the pump in 40-ml containers for VOC analyzes. The samples will be handled and labeled in accordance with the groundwater sampling section.

In addition to the groundwater samples, 2 trip blanks, 1 duplicate sample, and one equipment blank will be collected for quality assurance/quality control (QA/QC).

All purge water developed during the sampling event will be placed into 55-gallon drums and stored on Site. The results of the groundwater analyses will be used to characterize the purge water for proper disposal by Grenada Manufacturing.

Soil cores will be collected to evaluate the thickness and elevation of the top of the aquitard. A direct push soil sampler will be used to collect continuous soil cores from the surface to the top of the aquitard. Each soil core will be visually inspected and the geologic materials

logged in the field notebook, specifically noting the depth to which the aquitard was encountered.

Each Geoprobe® location will be surveyed for both vertical and horizontal control.

APPENDIX B

COMPLIANCE SCHEDULE FROM HSWA PERMIT (APPENDIX D - SCHEDULE OF COMPLIANCE)

Schedule of Compliance	Due Date
Notification of Newly Identified SWMUs and AOCs *Condition II.B.1. and* *Condition II.B.2.*	Within fifteen (15) calendar days of discovery
SWMU Assessment Report *Condition II.B.3.*	Within ninety (90) calendar days of notification
Notification for Newly Discovered Releases at Previously Identified SWMUs and AOCs *Condition II.C.1.*	Within fifteen (15) calendar days of discovery
Confirmatory Sampling Work Plan for SWMUs or AOCs identified in Appendix A.3 *Condition II.D.1*	Within forty-five (45) calendar days of notification by the Regional Administrator
Confirmatory Sampling Work Plan for SWMUs identified under Condition II.B.4. or AOCs identified under Condition II.B.1. *Condition II.D.2.*	Within forty-five (45) calendar days of notification by the Regional Administrator
Confirmatory Sampling Report *Condition II.D.5.*	In accordance with the approved CS Work Plan
RFI Work Plan for SWMU(s) and AOC(s) identified under Condition II.A.1. *Condition II.E.1.a.*	Within ninety (90) calendar days of notification by the Regional Administrator
RFI Work Plan for SWMU(s) and AOC(s) Identified under Condition II.B.4., Condition II.C.2., or Condition II.D.6. *Condition II.E.1.b.*	Within ninety (90) calendar days after receipt of notification by Regional Administrator (RA) which SWMUs or AOCs require an RFI
Draft RFI Report *Condition II.E.3.a.*	In accordance with the approved RFI Work Plan

Schedule of Compliance	Due Date
Final RFI Report *Condition II.E.3.c.*	Within thirty (30) calendar days after receipt of RA's final comments on Draft RFI Report
RFI Progress Reports *Condition II.E.3.d.*	Quarterly, beginning ninety (90) calendar days from the start date specified by the RA *
Interim Measures Work Plan *Condition II.F.1.a.*	Within thirty (30) calendar days of notification by RA
Interim Measures Progress Reports *Condition II.F.3.a.*	In accordance with the approved Interim Measures Work Plan ** or semi-annually for Permittee initiated IM
Interim Measures Report *Condition II.F.3.b.*	Within ninety (90) calendar days of completion
CMS Work Plan *Condition II.G.1.a.*	Within ninety (90) calendar days of notification by RA that a CMS is required
Implementation of CMS Work Plan *Condition II.G.2.*	Within fifteen (15) calendar days after receipt of RA approval of Plan
Draft CMS Report *Condition II.G.3.a.*	In accordance with the schedule in the approved CMS Work Plan
Final CMS Report *Condition II.G.3.a.*	Within thirty (30) calendar days of RA's final comments on Draft CMS Report
Demonstration of Financial Assurance *Condition II.H.3.*	Within one hundred twenty (120) calendar days after permit modification for remedy

Schedule of Compliance	Due Date
Noncompliance/Imminent Hazard Report *Condition I.D.14.*	Oral within 24 hours and written within fifteen (15) calendar days of becoming aware of the hazardous circumstances
Complete installation of emission control technology for units identified under *Condition IV.A.3.*	By "Installation Due Date" under Condition IV.A.3.
Written report of noncompliance of tanks, surface impoundments or containers with 40 CFR §§ 264.1082(c)(1) or (c)(2) *Condition IV.D.1.*	Within fifteen (15) calendar days of becoming aware of noncompliance
Written report of noncompliance of tanks with 40 CFR §§ 264.1084(c)(1) or (c)(2) *Condition IV.D.2.*	Within fifteen (15) calendar days of becoming aware of noncompliance
Semi-Annual Report for Use of Control Devices 40 CFR § 264.1090(c) *Condition IV.D.3.***	Semi-annually, beginning six (6) months from the effective date of the permit*

The above reports must be signed and certified in accordance with 40 CFR §270.11.

* This applies to Work Plan execution that requires more than one hundred eighty (180) calendar days

** This applies to Work Plan execution that requires more than one year.

*** Semi-annual report is not required if provisions of Condition IV.D.4. are met